

WHAT IS CLAIMED IS:

1. A method for automatically setting a gain for an amplifier in an optical network, comprising:
transmitting, from a source proximate an upstream
5 amplifier coupled to an optical span, a stable signal over the optical span; and
using the stable signal at a downstream amplifier coupled to the optical span to automatically set a gain of the downstream amplifier.
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2. The method of Claim 1, wherein the source comprises the upstream amplifier.
3. The method of Claim 2, wherein the stable
15 signal comprises amplified spontaneous emission (ASE) of the upstream amplifier.
4. The method of Claim 1, further comprising communicating power level information of the stable
20 signal to the downstream amplifier to be used to automatically set the gain of the downstream amplifier.
5. The method of Claim 4, wherein communicating power level information of the stable signal to the
25 downstream amplifier comprises communicating power level information of the stable signal over an optical supervisory channel (OSC).
6. The method of Claim 1, wherein the stable
30 signal comprises a signal having a power variation over time of approximately 1 dB or less.

7. The method of Claim 1, wherein the stable signal comprises a broadband signal.

8. The method of Claim 1, wherein transmitting a
5 stable signal comprises transmitting a stable signal at a power level such that the signal is received at the downstream amplifier at a power level of at least approximately -30 dBm.

10 9. The method of Claim 1, further comprising transmitting a request over an optical supervisory channel (OSC) for transmission of the stable signal for setting gain automatically.

15 10. The method of Claim 1, further comprising notifying the upstream amplifier that the gain of the downstream amplifier has been set.

20 11. The method of Claim 1, wherein the source comprises a light emitting diode (LED) coupled to the optical span.

12. The method of Claim 1, further comprising:
activating a setup mode of the upstream amplifier
25 and the downstream amplifier before transmitting the stable signal over the optical span; and

transitioning the upstream amplifier and the downstream amplifier to a normal operation mode after using the stable signal at the downstream amplifier to
30 automatically set the gain of the downstream amplifier.

13. The method of Claim 12, wherein:

activating a setup mode of the downstream amplifier comprises transitioning the downstream amplifier to an automatic level control (ALC) mode; and

5 wherein transitioning the downstream amplifier to a normal operation mode comprises transitioning the downstream amplifier to an automatic gain control (AGC) mode.

10 14. The method of Claim 1, further comprising blocking optical traffic communicating over the optical span before the optical traffic reaches the source using a shutter coupled to the optical span.

15 15. The method of Claim 14, wherein the shutter comprises a switch.

16. A system for automatically setting a gain for an amplifier in an optical network, comprising:

a source proximate an upstream amplifier coupled to an optical span, the source operable to transmit a stable
5 signal over the optical span; and

a downstream amplifier coupled to the optical span, the downstream amplifier operable to use the stable signal to automatically set a gain of the downstream amplifier.

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17. The system of Claim 16, wherein the source comprises the upstream amplifier.

18. The system of Claim 17, wherein the stable
15 signal comprises amplified spontaneous emission (ASE) of the upstream amplifier.

19. The system of Claim 16, wherein:

the upstream amplifier and the downstream amplifier
20 are operable to enter into a setup mode before transmission of the stable signal over the optical span; and

the upstream amplifier and the downstream amplifier are operable to transition to a normal operation mode
25 after using the stable signal at the downstream amplifier to automatically set the gain of the downstream amplifier.

20. The system of Claim 19, wherein:

30 the downstream amplifier operable to enter into a setup mode comprises the downstream amplifier operable to transition to an automatic level control (ALC) mode; and

wherein the downstream amplifier operable to transition to a normal operation mode comprises the downstream amplifier operable to transition to an automatic gain control (AGC) mode.

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21. The system of Claim 17, wherein the upstream amplifier is operable to communicate power level information of the stable signal to the downstream amplifier to be used to automatically set the gain of the downstream amplifier.

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22. The system of Claim 21, wherein the upstream amplifier is operable to communicate power level information of the stable signal to the downstream amplifier over an optical supervisory channel (OSC).

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23. The system of Claim 16, wherein the stable signal comprises a signal having a power variation over time of approximately 1 dB or less.

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24. The system of Claim 16, wherein the stable signal is a broadband signal.

25. The system of Claim 16, wherein a source operable to transmit a stable signal over the optical span comprises a source operable to transmit a stable signal over the optical span at a power level such that the signal is received at the downstream amplifier at a power level of at least approximately -30 dBm.

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26. The system of Claim 16, wherein the downstream amplifier is further operable to transmit a request over

an optical supervisory channel (OSC) for transmission of a stable signal for setting gain automatically.

27. The system of Claim 16, wherein the source
5 comprises a light emitting diode (LED) coupled to the optical span.

28. The system of Claim 16, further comprising a shutter coupled to the optical span, the shutter operable
10 to block optical traffic communicating over the optical span before the optical traffic reaches the source.

29. The system of Claim 28, wherein the shutter comprises a switch.

30. A method for automatically setting a gain for an amplifier in an optical network, comprising:

activating an automatic level control (ALC) mode of a downstream amplifier coupled to an optical span;

5 transmitting, from an upstream amplifier coupled to the optical span, a stable signal over the optical span, the stable signal comprising amplified spontaneous emission (ASE) of the upstream amplifier;

wherein the stable signal is transmitted at a power
10 level such that the signal is received at the downstream amplifier at a power level of at least approximately -30 dBm;

wherein the stable signal comprises a broadband signal comprising a power variation over time of
15 approximately 1 dB or less;

communicating, over an optical supervisory channel (OSC), power level information of the stable signal to the downstream amplifier to be used to automatically set a gain of the downstream amplifier;

20 using the stable signal and the power level information at the downstream amplifier to automatically set the gain of the downstream amplifier;

notifying the upstream amplifier that the gain of the downstream amplifier has been set;

25 transitioning the downstream amplifier to an automatic gain control (AGC) mode after using the stable signal and the power level information to automatically set the gain of the downstream amplifier; and

transitioning the upstream amplifier to a normal
30 operation mode after using the stable signal and the power level information at the downstream amplifier to automatically set the gain of the downstream amplifier.